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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,254	07/03/2003	Hui-Min Mao	10112381	4900

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EXAMINER


GARCIA, JOANNIE A

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 01/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/613,254	MAO ET AL.	
	Examiner	Art Unit	
	Joannie A Garcia	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-21 and 24 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7, 8, 10-12, 22, 23, 25-29 is/are rejected.
- 7) ☒ Claim(s) 4, 6 and 9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2823

The disclosure is objected to because of the following informalities: On page 7, line 19, "134" after "the insulating layer" should be replaced by --124--.

Appropriate correction is required.

Claims 6 and 18, are objected to because of the following informalities: In claims 6 and 18, line 2, "APM solution" should be preceded by --an--. Appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 10, 11, 22, and 23, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites the limitation "BPSG/TEOS stacked layer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

In claim 22, line 6, "port" after "BPSG until a" should be replaced with part.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7, 12, 25, 27, and 29, are rejected under 35 U.S.C. 102(b) as being anticipated by Kim (US 2001/0005611).

Art Unit: 2823

Kim discloses providing a substrate 100 with a transistor including a gate electrode 110/110a and a source/drain region 113/113a, the gate electrode being protected with a first insulating layer 114 (Figure 2, and Paragraphs 0042, and 0043), conformally forming a titanium/titanium nitride/tungsten stacked layer 122 on the substrate with the transistor thereon (Figure 4, and Paragraph 0054), defining the titanium/titanium nitride/tungsten layer to form an inner landing pad on the source/drain region (Figure 5), conformally forming a nitride passivation layer 126 on the inner landing pad, the transistor and the substrate (Figure 5, and Paragraphs 0058 and 0059), forming a second insulating layer 134 with an even surface on the nitride passivation layer (Figure 7, and Paragraph 0063), forming a contact hole in the second insulating layer and the nitride passivation layer to expose the inner pad landing (Figure 7, and Paragraph 0063), and filling a tungsten material in the contact hole (Figure 7, and Paragraph 0065).

Kim discloses a substrate 100, a transistor on the substrate, the transistor including a gate electrode 110/110a and a source/drain region 113/113a, the gate electrode protected with a first insulating layer 114 (Figure 2, and Paragraphs 0042, and 0043), an inner pad landing on the transistor and the source/drain region, the inner landing pad comprising a conformal titanium/titanium nitride/tungsten stacked layer 122 from the bottom up (Figures 4 and 5, and Paragraph 0054), a nitride passivation layer 126 on the transistor and the substrate (Figure 5, and Paragraphs 0058 and 0059), a second insulating layer 134 with an even surface on the nitride passivation layer (Figure 7, and Paragraph 0063), a contact plug in the second insulating layer and the nitride passivation layer to contact the inner pad landing (Figure 7, and Paragraph 0063), and a tungsten interconnecting landing pad on the contact plug (Figure 7, and Paragraph 0065).

Claims 2, 3, 5, 8, 26, and 28, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim as applied to claims 1, 7, 12, 25, 27, and 29 above, and further in view of Saito et al (U.S. Patent 6,399,438), Kobayashi et al (US 2003/0073280 A1), and the following comments.

Kim discloses defining the tungsten layer in the stacked layer 122 by etching (Paragraph 0056). Kim does not teach defining the tungsten layer by dry or wet etching.

Saito et al discloses forming a titanium/titanium nitride/tungsten stacked layer 36/40/41 and defining the tungsten layer 41 by dry etching (Figure 20, and Column 18, lines 43-46). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Kim and Saito et al to enable the step of forming stacked layer 122 of Kim to be performed.

Kobayashi et al discloses defining a tungsten layer 110 by wet etching (Paragraph 0078). It would have been within the scope of one of ordinary skill in the art to combine the teachings of Kim and Kobayashi et al to enable the step of forming the tungsten layer of Kim to be performed.

With respect to claims 2, 8, 26 and 28, it would have been a matter of routine optimization within the teachings of Kim to determine a suitable thickness to achieve the tungsten and passivation layers formation step.

Claims 4, 6, and 9, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2823

Claims 10, 11, 22 and 23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 13-21 are allowed.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956 until 2/4/04. See MPEP 203.08.

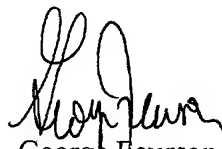
Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Joannie Adelle García whose telephone number is (703) 306-5733 until 2/4/04. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794 until 2/4/04 and (571) 272-1855 thereafter. The fax number for this group is 703-872-9306 for before final submissions, 703-872-9306 for after final submissions and the customer service number for group 2800 is (703) 306-3329. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.


JAG

January 9, 2004

George Fourson
Primary Examiner
Art Unit 2823
308-2544


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